

NEW DESCRIPTIONS

FIVE NEW SPECIES OF *TENTHREDO* LINNAEUS (HYMENOPTERA: TENTHREDINIDAE) FROM THE GARHWAL HILLS¹

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(With twenty-one text-figures)

Five new species of *Tenthredo* are reported from Garhwal hills, viz. *T. variolata*, *T. pseudofrontatus*, *T. acupunctata*, *T. serrulata* and *T. gopeshwari*. Apart from illustrating the genitalia, the new species have been separated from already reported related taxa. The population variation, if any, has also been discussed.

INTRODUCTION

Malaise's (1945) paper gives an exhaustive study of the taxonomy of Indian *Tenthredo* and includes a compilation of almost all the earlier works for southeast Asia, and has 18 new species of this genus from India. Mucbe's (1982, 1983) are the only works after Malaise (1945), which make an addition of 3 new species to that known earlier bringing the total number of species so far described from this country to 82. In the present study, which is one of the series of papers dealing with new records of *Tenthredo* from India, five new species are reported from the Garhwal hills (Uttar Pradesh). So far, this area has remained unexplored for sawflies.

The terminology used by Ross (1937, 1945) and Malaise (1945) has been followed.

The holotypes and paratypes are presently with the collection of the authors and will be submitted to IARI, Pusa National Collection, New Delhi (India), after this paper is published.

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Tenthredo variolata sp. nov.

(Figs. 1, 6, 11, 14, 17)

FEMALE: Average length 11.5 mm. Body black except lateral side of mandible; broad medial spot on clypeus; small anterolateral spot on pronotum and broad hind margin of metepisternum; yellowish white. Siennous are: broad dorsal angle of pronotum; propodeum except narrow basal margin; broad apical margin of abdominal segment 5; medial spot along posterior margins of terga 8 and 9. Following are yellowish brown: tegula; front side of distal 3/4 of profemur and tibia; pro- and mesotarsi except infuscated tips of joints. Wings light brownish hyaline, fore one with distinctly infuscated oblique stripe from apex almost to base, costa and stigma reddish brown, venation light brown to fuscous.

Antenna strongly incrassate before apex, 1.3× head width, segments 3 and 4 in ratio 9:4; clypeus (Fig. 1) roundly emarginate upto 1/7 of its medial length with truncate lateral teeth; labrum subpentagonal, broader than long in ratio 4:3 with roundly pointed anterior margin; malar space equal to diameter of lateral ocellus; LID : IDMO : EL = 2.0:3.4:2.5;

OCL : POL : OCL = 2.6:1.0:1.8; frontal area slightly above level of eyes; supra-antennal tubercle indistinct and confluent with similar frontal ridge; median fovea shallow with faint longitudinal carina; circum-, inter- and post-ocellar and lateral furrows fine and clear; postocellar area almost flat, broader than long in ratio 3:2; head slightly narrowing behind eyes; ITD : ICD = 2.6:1.0; mesoscutellum gibbose; appendage carinate; mesepisternum roundly and strongly raised; mesosternum lacking thorns; apical tooth of claw (Fig. 6) indistinctly longer than subapical; metabasitarsus as long as following 3 joints combined; meta-femur distinctly shorter than tibia.

Head covered with large, deep and almost confluent punctures of irregular size, hind orbit minutely punctured with scattered large punctures; mesonotum and scutellum punctured like face above; appendage with few large punctures; metanotum minutely and distinctly punctured; metascutellum impunctate; mesepisternum with large, deep, pit-like and isolated punctures along with smaller ones on intervening spaces; mesosternum finely punctured; propodeum polished, remaining terga micro-sculptured.

Lancet (Fig. 17) broadened in middle with 20 serrulae, each serrula is triangular having 2-5 anterior and 8-10 distinct posterior sub-basal teeth.

MALE: Length, 7.5 mm. Similar to female except: labrum with whitish basal spot; meso-femur having sordid white distal spot on front side. Penis valve (Fig. 11) and gonoforceps (Fig. 14).

Abbreviations (in text)

EL — eye length; ICD — intercencheri distance; IDMO — interocular distance at level of median ocellus; ITD — intertegular distance; LID — lower interocular distance; OCL — Oculo-occipital line; OOL — oculo-ocellar line; POL — postocellar line.

Material examined: Holotype, Female, Uttar Pradesh, Mandal—2300 m, 10.6.1983.

Paratypes: 10 ♀ ♀, 1 ♂, with same data as holotype.

Remarks: This species shows some resemblance to *T. odynerina* (Malaise, 1934). However, it can be separated from the latter by the black scape, siennous stripe along posterior margins of terga 1, 5, 8 and 9 and flat post-ocellar area with fine lateral furrow.

In *T. odynerina* the scape is pale, terga 1, 4 and 7-9 have pale stripe along posterior margins and postocellar area is subconvex with deep lateral furrow.

Etymology: The species name pertains to punctures of head and thorax which are deep pit-like, resembling marks of small pox.

***Tenthredo pseudofrontatus* sp. nov.**

(Figs. 2, 7, 12, 15, 18)

FEMALE: Average length, 10.7 mm. Body black, whitish are: lateral side of mandible; large basal spot on labrum; broad lateral spots confluent in middle on clypeus; triangular spot on lower hind orbit touching eye; dorsal angle and spot along posterior margin of pronotum; tegula except medial spot; ridges lateral to meso- and metascutelli; anterolateral spot on appendage; spot on metepisternum; lateral side and narrow hind margin of propodeum; anterolateral deflexed margin of tergum 4; spots on lateral margins of terga 7 and 8 and posterior margins of corresponding sterna; front side of proleg except base of coxa, tips of meso- and metacoxae, meso- and metatrochanters, meso-femur and tip of tibia. Black of abdomen with bluish tinge. Forewing having distinctly infuscated cross band over stigma, its base clear while apex subinfuscated beyond stigma, hindwing clear, stigma and venation dark brown to black.

Antenna stout, distinctly compressed. 2.5×

head width, segments 3 and 4 in ratio 10:9; clypeus (Fig. 2) arcuately incised upto 1/4 of its medial length; labrum broader than long in ratio 5:4 with narrowly rounded anterior margin; malar space 0.7× diameter of lateral ocellus; LID:IDMO:EL = 2.0:3.6:3.5; OOL:POL:OCL = 2.6:1.0:2.3; frontal area below level of eyes; supra-antennal tubercle raised and confluent with similar frontal ridge; median fovea shallow; circumocellar furrow clear, interocellar furrow very deep, post-ocellar one inconspicuous; lateral furrow narrow and deep; postocellar area subconvex with faint longitudinal carina, broader than long in ratio 5:4; head narrowing behind eyes; ITD:ICD = 2.9:1.0; mesoscutellum slightly raised; appendage faintly carinate; mesepisternum obtusely raised with short and blunt carina at apex; mesosternum faintly angled without thorns; apical tooth of claw (Fig. 7) slightly shorter than subapical; metabasitarsus shorter than following 3 joints combined; metafemur slightly longer than tibia.

Head shining having minute and scattered punctures, frontal area with distinct punctures, hind orbit minutely and densely punctured; mesonotum polished; mesoscutellum with widely separated distinct punctures on posterior slope only; appendage, metanotum and scutellum impunctate; mesepisternum minutely punctured with deep and large punctures along convexity; mesosternum distinctly punctured; abdomen shining with few minute and scattered punctures.

Lancet (Fig. 18) with 26 serrulae, each serrula is deep having 2-3 irregular anterior and 5-6 lobe-like posterior subbasal teeth.

MALE: Average length, 8.1 mm. Similar to female except: clypeus and labrum totally whitish; appendage without white spot; metafemur with dirty white stripe on underside of basal half; all sterna with whitish hind margin;

crossband of forewing less distinct. Penis valve (Fig. 12) and gonoforceps (Fig. 15).

Material examined: Holotype, Female, Uttar Pradesh, Mandal—2000 m, 15.6.1985.

Paratypes: 4 ♀♀, 3 ♂♂, with same data as holotype.

Remarks: This species belongs to a small group of two species having forewing with distinctly infuscated crossband over stigma and shows remarkable similarity to *T. frontatus* Malaise, 1945. However, it can be differentiated from the latter on account of the apex of the forewing infuscated beyond stigma, antenna 2.5× head width with segment 3 longer than 4, mesonotum and scutellar appendage polished, mesepisternum minutely punctured with deep and scattered punctures along convexity and lancet with 24 serrulae, each having 5-6 posterior subbasal teeth.

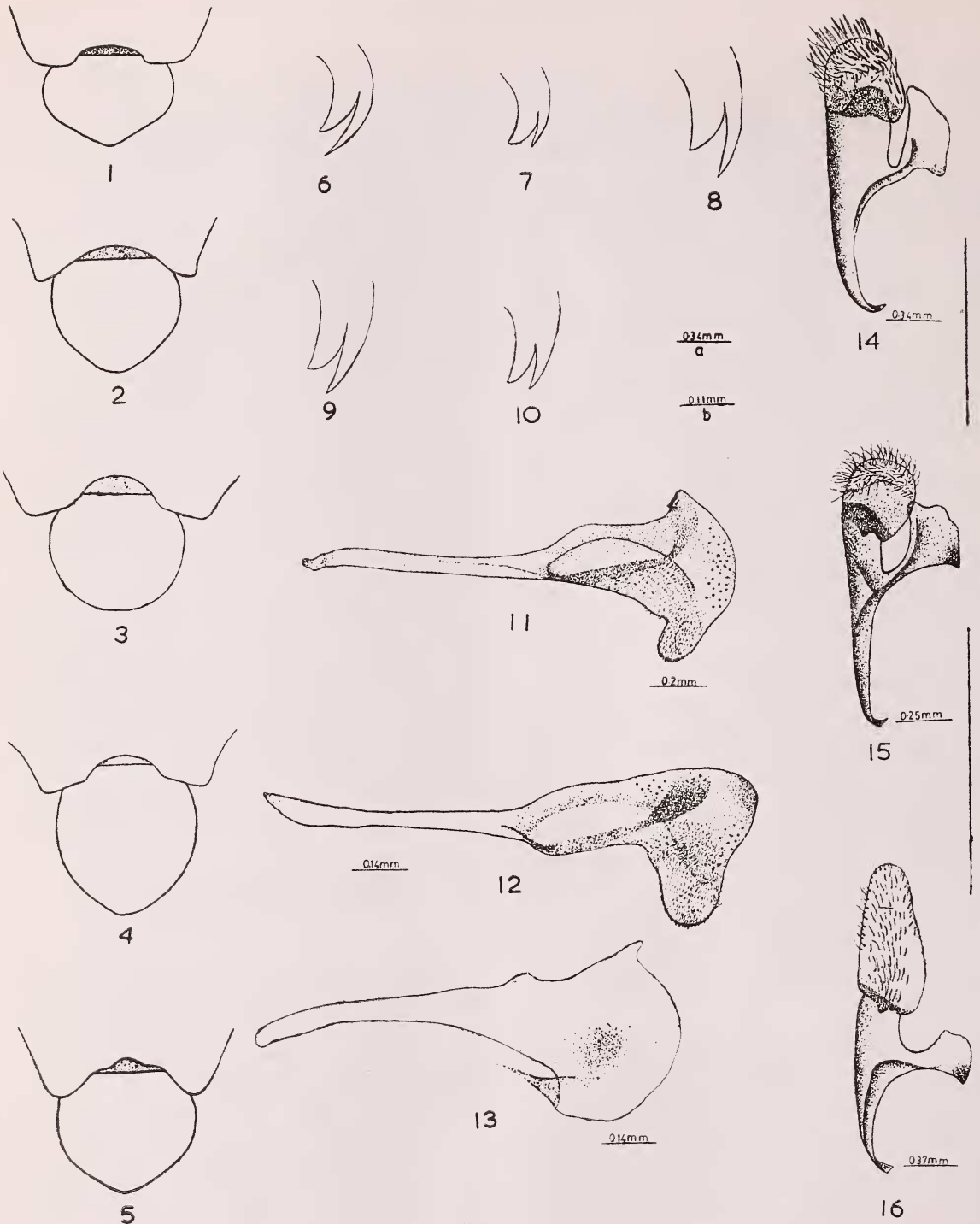
In *T. frontatus* apex of forewing is clear beyond stigma, antenna is 3.2 × head width with segment 3 shorter than 4, mesonotum is distinctly punctured and scutellar appendage wrinkled, mesepisternum is rugose along convexity and lancet has 31 serrulae, each having 2-4 posterior subbasal teeth.

Etymology: The species name pertains to its remarkable similarity with *T. frontatus*.

***Tenthredo acupunctata* sp. nov.**

(Figs. 3, 8, 13, 16, 19)

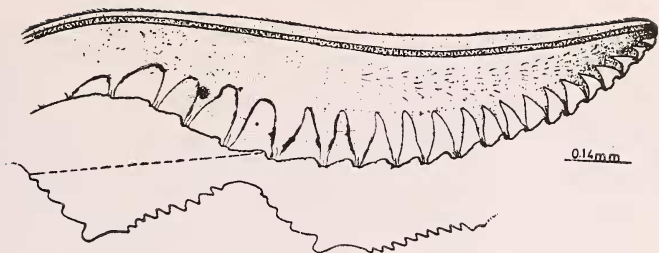
FEMALE: Average length 11.9 mm. Body pale yellow, black are: tip of antennal segment 6 and 7-9 entirely; mandible tip; frontal spot anteriorly covering basal half of supra-antennal tubercle, laterally not extending beyond lateral fovea and posteriorly reaching up to anterolateral corner of postocellar area; spot outer to supraantennal tubercle continuous with frontal spot; broad stripe along anterior margin of pronotum; anterior margin of mesonotal middle lobe and broad spot on lateral



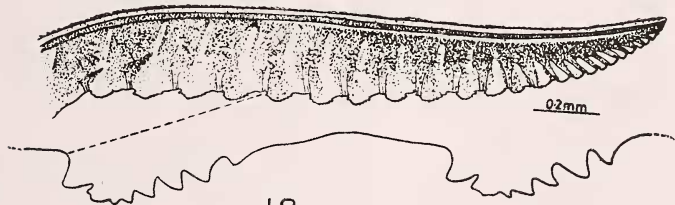
Figs. 1-16. Clypeus — 1. *T. variolata*, 2. *T. pseudofrontatus*, 3. *T. acupunctata*, 4. *T. serrulata*, 5. *T. gopeshwari*; Tarsal Claw — 6. *T. variolata*, 7. *T. pseudofrontatus*, 8. *T. acupunctata*, 9. *T. serrulata*, 10. *T. gopeshwari*; Penis Valve — 11. *T. variolata*, 12. *T. pseudofrontatus*, 13. *T. acupunctata*; Gonoforceps — 14. *T. variolata*, 15. *T. pseudofrontatus*, 16. *T. acupunctata*.

Figs. 1-5 at magnification a
 Figs. 6-10 at magnification b

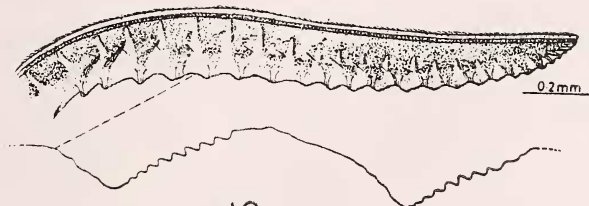
NEW DESCRIPTIONS



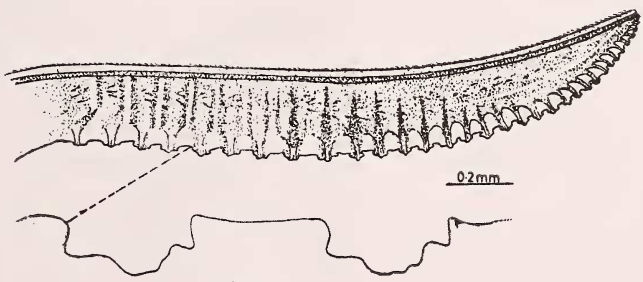
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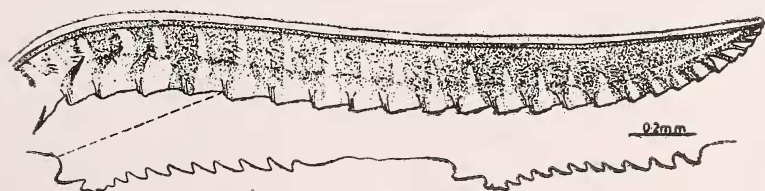
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21

Figs. 17-21. Lancelet — 17. *T. variolata*, 18. *T. pseudofrontatus*, 19. *T. acupunctata*, 20. *T. serrulata*, 21. *T. gopeshwari*.

lobe; visible part of mesopostnotum; spot on metanotum lateral to scutellum; irregular hind margin of metapostnotum; stripes along dorsal margin of mesepimeron and anterior margin of episternum; band along anterior border of mesosternum extending over its boundary with pleuron; large spot on metepisternum; proximal angle of mesocoxa and outer stripe on metacoxa; stripe along distal 2/3 of pro- and mesofemora posteriorly; basal spot on metafemur; metatibia except both ends. Abdomen having infuscated lateral spots along posterior borders of terga 2-6. Wings hyaline, costa and stigma yellowish, venation brown to black.

Antenna faintly compressed towards apex. $3.4 \times$ head width, segment 3 indistinctly shorter than 4; clypeus (Fig. 3) roundly, narrowly incised upto 2/7 of its medial length with truncate lateral teeth; labrum indistinctly broader than long with rounded anterior margin; malar space equal to diameter of lateral ocellus; LID: IDMO:EL = 2.0:2.3:3.3; OCL: POL: OCL = 3.9:1.0:2.8; frontal area below level of eyes; supraantennal tubercle distinctly raised, sloping back and confluent with low frontal ridge; median fovea deep and distinct in anterior half only; circum- and postocellar furrows indistinct, interocellar one clear; lateral furrow deep; postocellar area slightly raised, broader than long in ratio 5:4; head narrowing behind eyes; ITD:ICD = 3.3:1.0; mesoscutellum roundly raised; appendage faintly carinate; mesepisternum obtusely raised without carina or acute apex; mesosternum without thorns; apical tooth of claw (Fig. 8) slightly longer than subapical; metabasitarsus as long as following 3 joints combined; metafemur slightly shorter than tibia.

Head, mesonotum and scutellum subshining, minutely, shallowly and densely punctured; appendage with few large and shallow punctures; metanotum and scutellum shallowly punctured; mesepisternum finely punctured

with sebaceous lustre; mesosternum densely punctured and faintly microsculptured; abdomen microsculptured.

Lancet (Fig. 19) with 24 serrulae, each serrula is somewhat pointed having no anterior and about 9 posterior subbasal teeth.

MALE: Average length, 9.5 mm. Similar to female except: antennal segments 1-3 and basal half of 4 with black outer stripe; pro- and mesotibiae and tarsi striped with black posteriorly; basal 1/2 of metafemur black from upperside; first and last tarsal joints of metaleg, black. Penis valve (Fig. 13) and gonoforceps (Fig. 16).

Material examined: Holotype, Female, Uttar Pradesh, Chopta — 3000 m, 16.6.1985.

Paratypes: 3 ♀ ♀, 3 ♂ ♂, with same data as holotype.

Population variation: Metatibia only faintly infuscated in middle; abdomen without infuscated spots.

Remarks: Applying Malaise's (1945) key, this new species shows some similarity to *T. lissuana* Malaise, 1945 and *T. tibetana* Malaise, 1945. However, it can be distinguished from both on account of having the tip of antennal segment 6 and 7-9 entirely black, abdomen pale, at the most with small infuscated spots on terga 2-6, supraantennal tubercle and frontal ridge confluent, mesepisternum roundly raised without carina, head minutely and shallowly punctured and mesepisternum minutely punctured.

In *T. lissuana* the antenna is entirely pale, each abdominal tergum has large black spot, mesepisternum is flat with strong curved carina and head is coarsely punctured.

In *T. tibetana* the supra-antennal tubercle and frontal ridge are separated by broad furrow, the head is smooth and shining and mesepisternum is rugose along convexity.

Etymology: The species name pertains to fine and superficial punctures of body.

Tenthredo serrulata sp. nov.

(Figs. 4, 9, 20)

FEMALE: Length, 13.7 mm. Body pale to reddish yellow, black are: antenna except underside of scape; mandible tip; frontal spot anteriorly covering median fovea leaving tip of supraantennal tubercle, extending laterally without reaching eye and posteriorly touching hypothetical hind margin of head; postocellar area; most of posterior side of head; transverse medial stripe without reaching lateral margin and small spot at dorsal angle of pronotum; mesonotum except triangular apex of middle lobe and minute spot outer to mesoscutellum on lateral lobe; visible part of mesopostnotum; metanotum except spot on deflexed part; hind margin of metapostnotum; very narrow stripe along each pleural suture; propodeum except deflexed side and triangular medial spot along hind margin; narrow basal margin of tergum 2, interrupted in middle; metatibia except distal end. Apex of abdomen on dorsal side from tergum 6, tips of tibiae and tarsal joints, reddish brown. Wings yellowish hyaline, fore one infumated towards apex, stigma reddish yellow, venation dark brown to black.

Antenna stout, faintly compressed towards apex, $2.0\times$ head width, segments 3 and 4 in ratio 3:2; clypeus (Fig. 4) roundly and narrowly incised upto $1/6$ of its medial length with truncate lateral teeth; labrum indistinctly longer than broad with rounded anterior margin; malar space $1.6\times$ diameter of lateral ocellus; LID : IDMO : EL = 2.0 : 3.1 : 2.6; OOL : POL : OCL = 3.7 : 1.0 : 3.1; frontal area slightly below level of eyes; supraantennal tubercle distinctly raised and confluent with similar frontal ridge; median fovea narrow and deep with distinct pit in middle; circum-, inter- and postocellar furrows distinct; lateral furrow sunken; postocellar area convex with faint indication of longitudinal carina, as long

as broad; head slightly dilated behind eyes; ITD : ICD = 2.9 : 1.0; mesoscutellum subpyramidal; appendage bluntly carinate; mesepisternum obtusely raised with apex compressed and truncate; mesosternum slightly cornered but without thorns; apical tooth of claw (Fig. 9) longer than subapical; metabasitarsus shorter than following 3 joints combined; metafemur as long as tibia.

Head shining with minute and scattered punctures on hind orbit; mesonotum and anterior slope of scutellum polished; posterior slope of mesoscutellum and appendage with few minute punctures; metanotum and scutellum impunctate; mesepisternum with minute and indistinct punctures along with sebaceous lustre; mesosternum distinctly punctured; abdomen faintly microstriated and minutely punctured.

Lancet (Fig. 20) with 33 serrulae, each serrula is deep having single lobe-like anterior and 3-4 irregular posterior subbasal teeth.

MALE: Unknown.

Material examined: Holotype, Female, Uttar Pradesh, Chopta — 3000 m, 25.6.1985.

Paratype: No.

Remarks: This species shows close similarity to a Burmese species *T. flavobrunneus* Malaise, 1945. However, it can be differentiated from the latter by the frontal spot not touching eyes, postocellar area entirely black, costa black and appendage with some distinct punctures.

In *T. flavobrunneus* the frontal spot is connected with eye, hind margin of postocellar area is pale, costa is reddish yellow and appendage is polished.

Etymology: The species name pertains to characteristic shape of serrulae.

Tenthredo gopeshwari sp. nov.

(Figs. 5, 10, 21)

FEMALE: Average length, 13.2 mm. Body

reddish yellow with following black: tip of antennal segment 1, 2-5 entirely and immediate base of 6; mandible tip; spot near anterior margin of mesonotal middle lobe and large spot on lateral lobe; spot lateral to cenchrus; lateral spot on metapostnotum; large spot on metepimeron; metepisternum; dim anteromedial and lateral spots on propodeum; terga 6-9 except deflexed sides; sawsheath. Pale yellow are: antennal segment 6 except base. 7-9 entirely; face below antenna; narrow inner and lower hind orbits; posterolateral spot on pronotum; triangular apex of mesonotal middle lobe; mesoscutellum. Tips of all tarsal joints faintly infumated. Wings yellowish hyaline, apex of fore one distinctly infuscated upto distal end of stigma, hindwing faintly infumated towards apex, costa and stigma fulvous with infuscated spot on latter, venation dark brown to black.

Antenna filiform, $2.8\times$ head width, segments 3 and 4 in ratio 10:11; clypeus (Fig. 5) roundly incised upto $2/7$ of its medial length with irregular anterior margin; labrum broader than long in ratio 4:3 with rounded anterior margin; malar space equal to diameter of lateral ocellus; LID:IDMO:EL = 2.0:3.3:3.0; OOL:POL: OCL = 3.4:1.0:2.4; frontal area below level of eyes; supraantennal tubercle distinctly raised and confluent with similar frontal ridge; median fovea narrow with longitudinal carina in anterior half; circum-, inter- and post-ocellar furrows sharp; lateral furrow fine and deep, diverging posteriorly; postocellar area slightly raised with faint longitudinal carina. broader than long in ratio 5:4; head narrowing behind eyes; ITD: ICD = 3.8:1.0; mesoscutellum roundly raised; appendage faintly carinate; mesepisternum roundly raised; mesosternum lacking thorns; apical tooth of claw (Fig. 10) slightly shorter than subapical; metabasitarsus longer than following 3, but shorter

than all remaining joints combined; metafemur as long as tibia.

Head and mesonotum polished; mesoscutellum with a few distinct punctures on posterior slope only; appendage faintly wrinkled; metanotum and scutellum impunctate; mesepisternum with sebaceous lustre having shallow and scattered punctures; mesosternum distinctly punctulate; propodeum polished, remaining terga minutely and finely punctured.

Lancet (Fig. 21) with 25 serrulae, each serrula is almost flat having 1-2 anterior and about 11 posterior subbasal teeth.

MALE: Unknown.

Material examined: Holotype, Female, Uttar Pradesh, Mandal — 2300 m, 16.6.1985.

Paratypes: 4 ♀♀, with same data as holotype.

Population variation: Tergum 5 completely black.

Remarks: In the peculiar colour of the antenna this species does not show relationship with any other species. However, it shows a distant similarity to *T. purpleipennis* Malaise, 1945 but can be easily separated from the latter on account of having black antenna with pale yellow apical segments, supra-antennal tubercle and frontal ridge confluent and apical tooth of claw shorter than subapical.

In *T. purpleipennis* the antenna is black with basal 3 segments reddish, supra-antennal tubercle is separated from frontal ridge and apical tooth of claw is longer than subapical.

Etymology: The species name has been taken from the city situated near its type locality.

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A NEW SPECIES OF *STICTOPISTHUS* THOMSON (HYMENOPTERA: ICHNEUMONIDAE) FROM INDIA¹

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(With four text-figures)

Stictopisthus carinata sp. nov. is described and a key to the Indo-Australian species of *Stictopisthus* is provided.

INTRODUCTION

Stictopisthus Thomson (Hymenoptera: Ichneumonidae: Mesochorinae) is a moderate sized genus with worldwide distribution. Species of this genus are secondary parasitoids of lepidopterous larvae and hyperparasitoids of species of *Euphorus* Nees and *Cotesia* (= *Apanteles*) Cameron (Braconidae). Townes *et al.* (1961) recorded seven species from Indo-Australian region, namely *Stictopisthus australiensis* Szépligeti from Australia, *S. javensis* Ferrière from Java, *S. guamensis* Townes from Micronesia and *Mesochorus hapaliae* Rao, *M. panti*

Rao, *M. plusiaephilus* Viereck, and *M. srinairaini* Gupta from India. Townes (1971) provided generic diagnosis, pictorial key and distribution of this genus. In the present study a new species, *Stictopisthus carinata* is described based on the material collected from Aurangabad, Maharashtra, India and a key to the Indo-Australian species of *Stictopisthus* Thomson is provided.

The types are with the authors for the time being and will be deposited in National collection of the Zoological Survey of India, Calcutta.

Stictopisthus carinata sp. nov.

FEMALE: 6.20 mm in length. *Head* (Figs. 2-3): 0.80 as long as broad, above 2× as broad as thick; vertex weakly, sparsely punctate; ocellar triangle moderately raised, sparsely punctate; ocello-ocular distance 2× their diameter; frons finely mat, above antennal

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